NIH NATIONAL CANCER INSTITUTE

iCURE

Intramural Continuing Umbrella of Research Experiences (iCURE) – 2018 Possible Projects

Possible Projects in the Center for Cancer Research (CCR)

Name	Level of Scholar	Currently Available Research Areas and Projects	Location (Cities in Maryland)
Christine Alewine, MD, PhD	All	The Alewine lab does translational research in pancreatic cancer and is particularly interested in immunotoxin therapeutics. Techniques used include mouse modeling, standard molecular and cell biology assays and flow cytometry. https://ccr.cancer.gov/Laboratory-of-Molecular-Biology/christine-campo-alewine	Bethesda
Terri Armstrong, PhD	Postdoctoral Fellows	The Armstrong lab is currently focused on developing models of cranial irradiation to explore associated toxicity. Preliminary data in the clinic suggests that SNPs in clock genes may be associated with increased risk of toxicity. The current project will include development and testing of the model, and use of transgenic mice to evaluate this effect. https://ccr.cancer.gov/Neuro-Oncology-Branch/terri-s-armstrong	Bethesda
Joe Barchi, Jr., PhD	All	The Barchi lab studies the function of tumor-associated carbohydrate antigens (TACAs), aberrant glycan structures present on tumor cells that contribute to both the immune response to tumors and their aggressiveness. Organic synthesis is used to design probes and vaccine constructs of TACA-peptide conjugates as antitumor therapeutic agents. The vaccine constructs are comprised of TACA-based glycopeptides and molecular adjuvant molecules bound to gold nanoparticles. A current project is to design and find optimum conditions for the synthesis of novel nanoparticles that can activate antigen-presenting cells (APCs). https://ccr.cancer.gov/Chemical-Biology-Laboratory/joseph-j-barchi	Frederick
Pedro Batista, PhD	Graduate Student	The Batista lab aims to understand, at the molecular level, how interactions between cellular metabolism and the RNA epitranscriptome impact the RNA-centric regulatory networks that control cell identity, and how disruption of such pathways contributes to the establishment and proliferation of cancer. A particular interest is in understanding how accumulation of oncometabolites, such as 2HG, disrupt RNA demethylases and induce changes in RNA metabolism. The lab employs a very broad range of state-of-the-art techniques in modern biology including RNA-seq, proteomics and CRISPR genome editing. https://ccr.cancer.gov/Laboratory-of-Cell-Biology/pedro-j-batista	Bethesda
Yamini Dalal, PhD	Graduate Students Postdoctoral Fellows	https://ccr.cancer.gov/Laboratory-of-Receptor-Biology-and-Gene-Expression/yamini-dalal	Bethesda

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Freddy Escorcia, MD, PhD	All	The Escorcia lab is interested in targeted therapies for human cancers, and focuses on using radionuclide-based constructs to visualize and treat models of hepatobiliary cancers. Projects may include bioinformatics screens of potential targets and early in vitro validation, dosimetric modeling of our agents to determine dose needed kill tumors effectively, devising synthetic chemistry schemes to improve on existing methods, generating engineered cell lines for assessing sensitivity to therapy, standard biochemical assays (e.g. Western blot, ELISA, cell binding, cell kill assays), and in vivo models of human tumors for imaging and therapy studies. https://ccr.cancer.gov/Molecular-Imaging-Program/freddy-e-escorcia	Bethesda
Gordon Hager, PhD	All	https://ccr.cancer.gov/Laboratory-of-Receptor-Biology-and-Gene-Expression/gordon-l-hager	Bethesda
Jonathan Keller, PhD	Post-baccalaureate Post-master's Graduate Students	The Keller lab studies the cellular and molecular regulation of stem cells. This includes defining the function of transcriptional regulators in stem cell quiescence, and self-renewal and differentiation using biochemical, molecular, and gene targeted and transgenic mouse models. Methods will include lineage tracing and single cell analysis of stem cells. https://ccr.cancer.gov/mouse-cancer-genetics-program/jonathan-r-keller	Frederick
Stuart Le Grice, PhD	Post-baccalaureate Post-master's Postdoctoral Fellow	The Le Grice lab focuses on the area of RNA biology, with specific emphasis on: 1) studying the structure of long non-coding (lnc) RNAs in their natural cellular environment; 2) using this information to identify small molecule antagonists of cis-acting regulatory RNA sequences; and 3) exploiting the newly-discovered coding potential of circular RNAs to develop mRNA vaccines. Techniques in the lab include a range of molecular, biochemical, biophysical, and biological strategies. https://ccr.cancer.gov/Basic-Research-Laboratory/stuart-fj-le-grice	Frederick
Stan Lipkowitz, MD PhD	Post-baccalaureate Post-master's Postdoctoral Fellows	The Lipkowitz lab investigates signal transduction pathways that regulate growth and programmed cell death in epithelial cancer cells. Ongoing projects include: 1) Regulation of signaling by Cbl proteins RTKs, such as EGFR, HER2, MET and RET, that are often inappropriately active (due to mutation or overexpression) in a wide array of epithelial malignancies 2) Activation of death receptor pathways to kill breast cancer cells 3) Inhibition of breast cancer cells by the novel drug ONC201 https://ccr.cancer.gov/Womens-Malignancies-Branch/stanley-lipkowitz	Bethesda
Marston Linehan, MD	All	https://ccr.cancer.gov/urologic-oncology-branch/w-marston-linehan	Bethesda

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Zhenggang Liu, PhD	All	The Liu lab studies the mechanism of cell death and inflammation, both of which are key regulating processes in tumorigenesis. The Liu lab specializes in molecular and cellular biology and immunology studies. https://irp.nih.gov/pi/zheng-gang-liu	Bethesda
Tom Misteli, PhD	Post-baccalaureate Postdoctoral Fellows	The Misteli lab studies the 3D organization of the genome in the context of health and disease. Methods include a combination of high-end imaging techniques, molecular tools and biochemistry approaches. Specific projects include: 1) Development of a high-throughput imaging assay for the detection of DNA damage in human tissue samples to assess the relationship of DNA damage and aging. This project is well suited for a post-bac student. 2) Development of a novel imaging technology to enable use of multi-gene expression fingerprints in RNAi and small molecule screening approaches. This project is well suited for a post-doctoral fellow. 3) Mapping of 3D genome organization using high-throughput imaging. This project is suitable for either a post-bac student or post-doc fellow. https://ccr.cancer.gov/Laboratory-of-Receptor-Biology-and-Gene-Expression/tom-misteli	Bethesda
Beverly Mock, PhD	All	Available projects include: 1) Evaluation of drug combinations that not only affect tumor cell viability, but also target the MYC oncogene. 2) Determine which members of the ROS, OXPHOS and metabolic pathways contribute to oproxomib drug resistance in a set of 3-4 myeloma cell line pairs, where one member of the pair has already been rendered resistant to this proteasome inhibitor. 3) Validate the results of mass spec experiments that have already been performed to distinguish which members of the mTORC1/2 complexes bind to different alleles of mTOR that have been implicated as susceptibility/resistance genes. https://ccr.cancer.gov/Laboratory-of-Cancer-Biology-and-Genetics/beverly-mock	Bethesda
Brid Ryan, PhD	Graduate Students Postdoctoral Fellows	The Ryan lab is focused on lung cancer and has two complimentary research projects. The overall goal is to improve prevention, early diagnosis, and survival among African-Americans by gaining an understanding of their exposures and tumor biology and then leveraging this knowledge to improve health outcomes. The Ryan lab studies the biology of lung cancer in African Americans and the factor(s) that contribute to the excess lung cancer incidence observed among African Americans. https://ccr.cancer.gov/Laboratory-of-Human-Carcinogenesis/brid-m-ryan	Bethesda
Brad St. Croix, PhD	Postdoctoral Fellow	The St. Croix lab studies cell surface transmembrane proteins that are overexpressed in tumor-associated vasculature. Two of these proteins, CD276 (B7-H3) and TEM7 (PLXDC1), are recently found to be also overexpressed in the tumor cells of rare pediatric tumors. A	Frederick

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		good project for a postdoctoral fellow would be to understand the role these two proteins play in pediatric tumor growth and devise new and improved antibody-based therapeutic strategies to combat pediatric cancers. https://ccr.cancer.gov/Mouse-Cancer-Genetics-Program/brad-st-croix	
Pat Steeg, PhD	Postdoctoral Fellow	Available projects include: 1) Brain metastasis of breast cancer. The project investigates how the blood-tumor barrier can be modified to allow greater penetration of drugs into brain metastases. The project is a combination of basic and translational biology, including molecular biology, imaging, animal experiments, experimental therapeutics. 2) The NM23 metastasis suppressor. The project will study how NM23 protein halts metastasis, using biochemistry, cell biology, animal experiments, and molecular biology. This project is more basic research with some translational relevance. https://ccr.cancer.gov/Womens-Malignancies-Branch/patricia-s-steeg	Bethesda
Esta Sterneck, PhD	Post-baccalaureate Post-master's	The Sterneck lab conducts basic research using inflammatory breast cancer (IBC) cell lines and xenograft mouse models to characterize the molecular signaling pathways that regulate breast cancer cell biology, with particular emphasis on the functions of the transcription factor C/EBPδ (CEBPD). Ongoing projects include: 1) Identify the molecular pathways that lead to high level CEBPD expression in IBC 2) Determine the drug-sensitivities of IBC cells and the underlying mechanisms of response or resistance 3) Characterize how CEBPDregulated pathways contribute to the malignant features of IBC cells https://ccr.cancer.gov/Laboratory-of-Cell-and-Developmental-Signaling/esta-sterneck	Frederick
Sandra Wolin, MD PhD	All	The Wolin lab studies how noncoding RNAs function, how cells recognize and degrade defective RNAs, and how failure to degrade these RNAs contributes to human disease. One pathway that we study involves noncoding RNA-protein complexes known as Ro60 ribonucleoproteins (RNPs). In all studied organisms, Ro60 binds noncoding RNAs called Y RNAs. Current projects include uncovering new roles for Ro60 and Y RNAs in mammalian cells and bacteria, obtaining a high-resolution structure of the new RNA degradation machine and identifying new RNA surveillance pathways in mammalian cells. https://ccr.cancer.gov/RNA-Biology-Laboratory/sandra-l-wolin	Frederick
Li Yang, PhD	All	The Yang lab focuses on cancer metastasis, and uses mouse models, human datasets, and a variety of technology platforms to understand the fundamental aspects of metastasis biology. Current projects include: 1) The cellular and molecular mechanisms underlying tumor-associated immune suppression and inflammatory tumor microenvironment. Specifically, this project studies	Bethesda

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		TGFbeta signaling in breast cancer metastasis with a focus on host immune/inflammatory response as well as its crosstalk with the tumor compartment. 2. The epigentic reprogramming of metastatic cancer cells in invasion, and distant colonization. This project aims to discover novel mediators important for primary tumor microenvironment and metastatic distant site. https://ccr.cancer.gov/Laboratory-of-Cancer-Biology-and-Genetics/li-yang	
Howard Young, PhD	Post-baccalaureate	Current projects include the study of the development of autoimmune disease in a mouse model of chronic interferon-gamma gene expression. This will involve characterization of anti-glycan antibodies and their relationship to microbiome exposure as well as a determination of the antibodies produced in this mouse model of autoimmunity. Furthermore, the project will involve analysis of the effects of probiotic administration on the development of autoimmunity. https://ccr.cancer.gov/Cancer-and-Inflammation-Program/howard-a-young	Frederick

Possible Projects in the Division of Cancer Epidemiology and Genetics (DCEG)

Name	Level of Scholar	Currently Available Research Areas and Projects	Location (Cities in Maryland)
Sonja Berndt, PharmD, PhD	Postdoctoral Fellow	The Berndt group focuses on investigating and understanding the genetic etiology of lymphoid malignancies and prostate cancer. There is ongoing genome-wide association studies (GWAS) and next generation sequencing projects in prostate cancer and different types of lymphoid malignancies, including both rare and common subtypes of non-Hodgkin lymphoma. Opportunities exist to conduct research on the genetic and biological underpinnings of cancer, as well as important molecular biomarkers. https://irp.nih.gov/pi/sonja-berndt	Rockville
Elizabeth Khaykin Cahoon, PhD	Post-master's Postdoctoral Fellow	The Cahoon group focuses on skin cancer risk in individuals exposed to photosensitizing medications. Projects include: 1) Use a large nationwide administrative dataset to conduct a series of comprehensive analyses of photosensitizing medications in relation to the most UV sensitive cancers, keratinocyte carcinomas, and their precursors (e.g., actinic keratosis). This project is appropriate for a postdoctoral fellow. 2) Studies of thyroid cancer and other disease risks in residents of Ukraine and Belarus exposed to Chernobyl fallout as children and adolescents. This is a long-term, multi-	Rockville

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		country, international collaboration, appropriate for post-master's individuals or postdoctoral fellows. https://dceg.cancer.gov/about/staff-directory/biographies/A-J/cahoon-elizabeth	
Cari Kitahara, PhD,	Postdoctoral Fellow	The Kitahara group studies exposures involved in the etiology of thyroid cancer through various study design and methodologic approaches. Potential opportunities include cohort and pooled analyses of thyroid cancer risk in relation to 1) diet, lifestyle, hormonal, and environmental factors, 2) exposures in early life and pregnancy, and 3) medical and environmental exposure to ionizing radiation. https://dceg.cancer.gov/about/staff-directory/biographies/A-J/kitahara-cari	Rockville
Mitchell Machiela, ScD, MPH	Postdoctoral Fellow	The Machiela group conducts integrative analyses on the genetic etiology of cancer. Specific areas of research include: 1) Next generation sequencing studies to identify acquired mutations that could impact cancer risk in special exposure populations (e.g., drug and radiation exposure). 2) Studies characterizing the distribution and determinants of structural mosaic copy number changes in large cancer case/control and cohort studies (~200,000 participants) with existing array genotyping data. 3) Genome-wide association studies in pediatric cancers to identify and functionally map germline variants associated with increased risk (e.g., Ewing sarcoma). https://dceg.cancer.gov/about/staff-directory/biographies/K-N/machiela-mitchell	Rockville
Meredith Shiels, PhD	Postdoctoral Fellow	The Shiels group conducts several studies using population-based data sources to 1) estimate cancer incidence and mortality patterns, 2) quantify the role of cancer risk factors in explaining temporal trends, and 3) supplementing traditional surveillance data resources with novel data through data linkage and statistical modeling. Potential candidates should have a broad interest in descriptive research using registry data, linked data resources and national surveys. https://dceg.cancer.gov/about/staff-directory/biographies/K-N/Shiels-Meredith	Rockville
Rachael Stolzenberg-Solomon, PhD, MPH, RD	Postdoctoral Fellow	The Stolzenberg-Solomon group focuses on clarifying the etiology of pancreatic cancer through various study design and molecular approaches, as well as biomarker and metabolic studies particularly related to nutritional exposures and diabetes. Potential opportunities include: 1) Cohort analyses of diet and lifestyle exposures 2) Molecular epidemiologic studies to investigate genetic susceptibility (e.g. GWAS) and biomarkers (including metabolomics) in prospective studies 3) Studying biologic mechanisms underlying epidemiologic risk factors using biomarkers. https://dceg.cancer.gov/about/staff-directory/biographies/O-Z/stolzenberg-solomon-rachael	Rockville

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Rose Yang, PhD, MPH	Postdoctoral Fellow	The Yang group focuses on integrating genomic (next-generation sequencing, SNP array, RNASeq, methylation), pathology, morphology, and imaging data (mammographic density) into epidemiologic studies of breast cancer for a better understanding of etiologic and racial heterogeneity. https://dceg.cancer.gov/about/staff-directory/biographies/O-Z/yang-rose	Rockville
Bin Zhu, PhD	Postdoctoral Fellow	The Zhu group includes integrative analysis of multi-platform high-dimensional cancer genomics data with epidemiology and clinical outcomes. Available projects will focus on development and application of statistical methods and bioinformatics tools for integrative cancer genomic analysis. https://irp.nih.gov/pi/bin-zhu	Rockville